

(12) UK Patent Application (19) GB (11) 2 215 300 (13) A
(43) Date of A publication 20.09.1989

(21) Application No 8804665.1

(22) Date of filing 27.02.1988

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(51) INT CL⁴

B65B 13/02

(52) UK CL (Edition J)

B8F F1A1 F1B F11A F5

B8C CW18

(56) Documents cited

GB 2118516 A GB 1502822 A GB 1203778 A

EP 0245817 A1 EP 0225665 A1

(58) Field of search

UK CL (Edition J) B8C CW18, B8F F1B F5

INT CL⁴ B65B, B65C

(54) Tape applicator machine

(57) A tape applicator machine (10) has a conveyor (11) to transport articles (12) through an application station (13) and two tape supply spools (15) are provided on opposite sides of the conveyor (11) at the station (13).

Adhesive tape is wrapped around the articles (12) as they move through the applications station (13) by movement of opposite pair of tape support rollers (22) towards each other across the conveyor (11). The two tapes adhere to each other and are severed from the spools (15) by cutter (23) which passes between the support rollers (22).

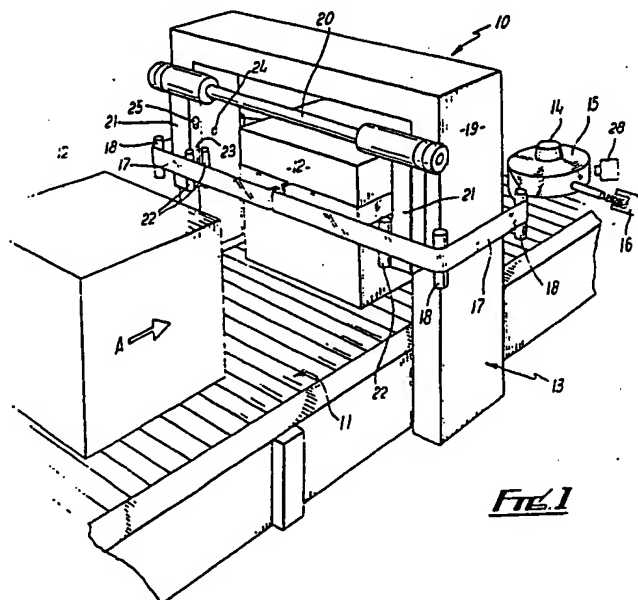


FIG. 1

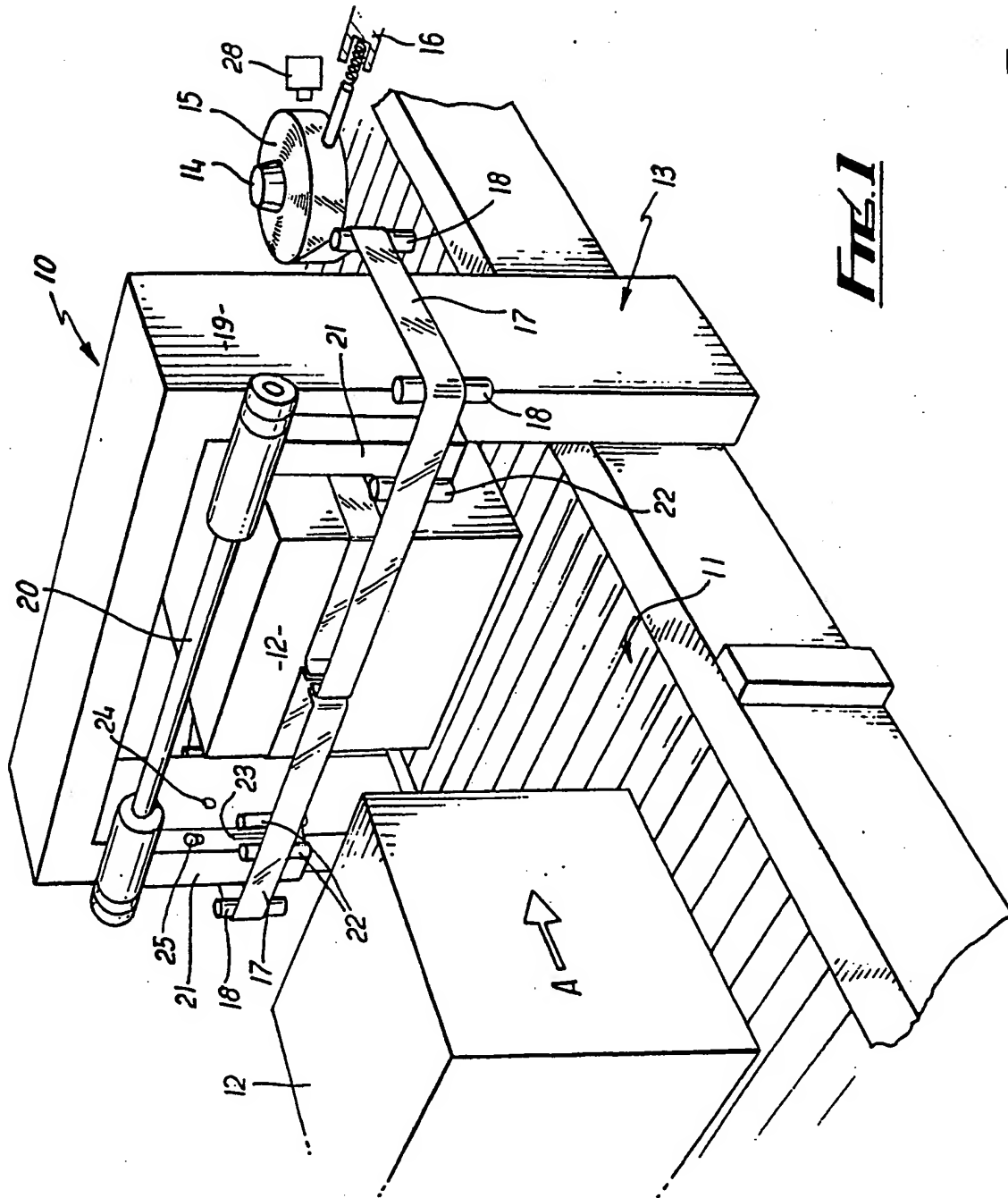
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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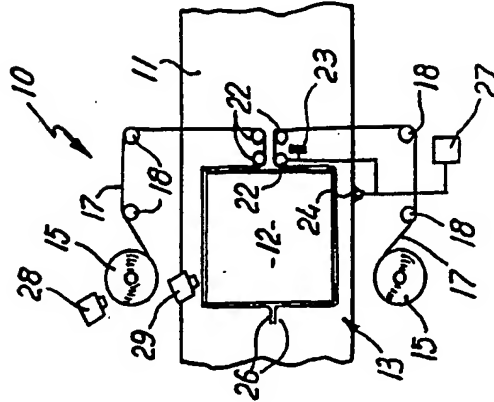


Fig. 2

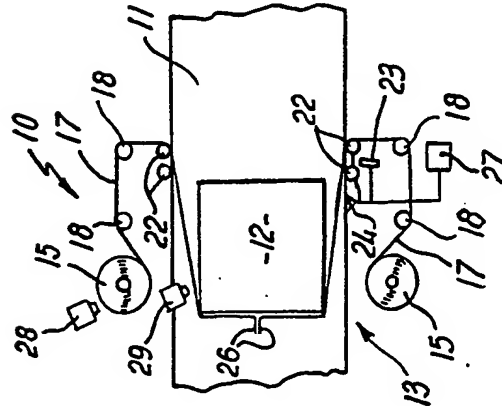


Fig. 3

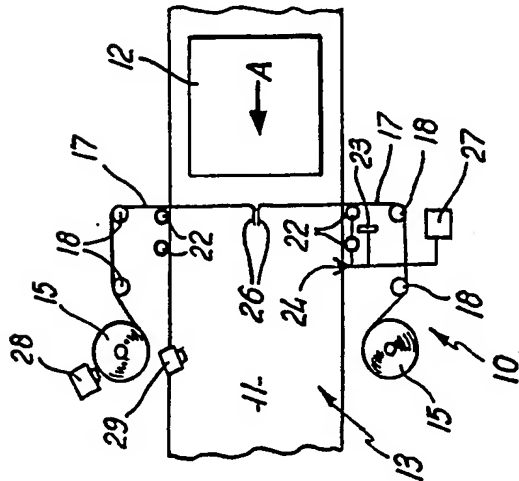


Fig. 4

TAPE APPLICATOR MACHINE

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This invention relates to a tape applicator machine,
and in particular to a machine for applying an adhesive
tape to a block, package or like article for identification
5 and/or sealing purposes.

The invention provides a tape applicator machine
comprising a conveyor operable to convey an article
through an application station of said machine, two tape
supply means disposed on opposed sides of said conveyor,
10 two tape support means disposed on opposed sides of said
conveyor and each movable from a first position adjacent
the respective side of said conveyor, whereby said article
may pass between said tape support means to said application
station, to a second position, whereby tape from one supply
15 means and supported by one support means is brought into
contact with the tape from the other supply means and
supported by the other support means, and cutting means
operable to cut both of said tapes simultaneously at their
region of mutual contact.

20 Each said tape support means may comprise a pair of
rollers mounted in mutually substantially parallel
disposition, and said rollers may be spaced from each
other by a distance sufficient to allow said cutting means
to pass therebetween. Each of said pairs of rollers may
25 be mounted on a support arm which is movable transversely
of said conveyor, and said cutting means may be mounted on

one of said support arms.

The machine may comprise sensing means operable to detect the presence of an article in said application station and to cause control means to move said tape support means from said first position to said second position. Said control means may be operable to move said cutting means between said rollers of one of said tape support means to cut said tapes.

Said control means may be operable to stop said conveyor when said sensing means detects the presence of an article in said application station, prior to said moving of said tape support means. Said control means may also be operable to move said tape support means from said second position to said first position after said tapes have been cut, and may also be operable then to restart said conveyor. Said sensing means may comprise photoelectric sensing means.

Each tape supply means may comprise a support adapted to rotatably support a reel of tape, and may comprise braking means operable to allow but resist rotation of said reel.

The machine may also comprise heating means adapted to heat said tapes in the region of said application zone. Said heating means may comprise heated air blowing means. The machine may also comprise printing means, which may be located adjacent at least one of said tape supply means.

Alternatively, or additionally, said printing means may be located in said application station and be operable to print onto said tape when attached to said article.

The invention will now be described with reference
5 to the accompanying drawing in which:-

Fig. 1 is a perspective view of a machine in
accordance with the invention, and

Figs. 2 to 4 are diagrammatic plan views of the
machine of Fig. 1 at differing stages of
10 the tape application procedure.

Referring now to Fig. 1 there is shown a tape
applicator machine 10 comprising a conveyor 11 which is
operable to convey an article 12 to an application
station 13 of the machine 10. Near to the application
15 station 13 there are provided two supports 14, one on
each side of the conveyor 11, each to receive a spool
15 of adhesive tape. The support 14 may comprise a
fixed spindle on which the spool 15 can freely rotate,
or may comprise a rotatable spindle on which the spool 15
20 is fixedly mounted. In either case a brake device 16 may
act on the spool or spindle, as appropriate, so as to
allow rotation of the spool 15 but provide a resistance
to such rotation to maintain a tension in the tape 17 as
it is pulled off the spool 15. Guide rollers 18 are
25 provided to guide the tape 17 to the application station 13.

A frame 19 of the machine 10 passes around the

application station 13 and supports a bar or beam 20 extending above and laterally of the conveyor 11. Mounted on the bar or beam 20 so as to be movable therealong are two supports 21, one at each side of the conveyor 11 and each carrying a pair of spaced parallel, application rollers 22. Also mounted on one of the supports 21, and disposed between the application rollers 22 on that support 21, is a cutter 23. A photo-electric detector 24 is provided on the frame 19 to detect the presence at or absence from the application station 13 of an article 12. One or more heaters 25, such as hot air blowers, are also provided to ensure the maximum tackiness of the tapes 17, at least in the region of the cutting heads 23 and application rollers 22.

Operation of the machine 10 is as follows. Initially, two spools 15 of tape 17 are placed on the spool supports 14. The tape 17 is an adhesive tape and may be between 1cm and 15cm in width. The tape 17 may be clear or may be pre-printed with any desired information thereon.

The free ends 26 of the tapes 17 are then pulled from the spools 15, guided around the guide rollers 18, joined together above the centre of the conveyor 11 at the upstream side of the application station 13, as shown in Fig. 2. At this stage the supports 21 are in their retracted position as shown in Figs. 1 and 2, i.e. at the sides of the conveyor 11. The conveyor 11 is then activated in

conventional manner to advance the first article 12 in the direction of arrows A to the application station 13. Firstly the article 12 will contact the joined tapes 17, and then it will pull more tape 17 from the spools 15 as the article 12 moves to the position shown in Fig. 3. The sensor 24 detects the presence in the application station 13 of an article 12 and causes a control device 27 to stop the conveyor 11. As will be seen in Fig. 3 the tapes 17 will be, at this stage in the procedure, wrapped around the forward part of the article 12. The control device 27 then operates the supports 21 to move inwardly, being operated either pneumatically or electrically, to the position shown in Fig. 4. As the supports 21 move, the application rollers 22 mounted thereon push the tapes 17 around the rearward part of the article 12. The movement of the supports 21 is sufficient to cause the two tapes 17 to come into contact with each other above the centre of the conveyor 11. If required, hot air from the heater 25 ensures that the maximum tackiness of the tapes 17 is maintained so that the two tapes 17 adhere to each other securely. The control means 27 then activates the cutter 23 to cut through both tapes 17 between the pairs of application rollers 22 on each support 21, thereby sealing the tapes 17 around the article 12 and leaving new free ends 26 of the tapes 17 extending from the spools 15. The control

means 27 then causes the supports 21 to move back to the retracted position shown in Figs. 1 and 2, and restarts the conveyor 11 so as to bring the next article 12 to the application station 13. The above described
5 process is then repeated for each article 12 to be taped.

If desired a print head 28 or 29 may be provided to print information such as batch number, date or other reference onto the tape 17 on reels 15, or onto the tape
10 17 or article 12 respectively. Control of the print head 28 or 29 may be effected by the control means 27.

Movement of the supports 21 inwardly will create a tension in the tapes 17 as they are wrapped around the rearward end of the article 12, particularly since for
15 such movement to take place tape 17 must be unwound from the reels 15 against the resistance provided by the braking means 16. The tape 17 applied to the article 12 may be for sealing purposes, for example if the articles 12 are cartons, boxes, cases or the like, or
20 may be for identification purposes for those articles or for other articles such as concrete blocks.

Alternative embodiments of machine in accordance with the invention will be readily apparent to persons skilled in the art. For example, two or more bands of tape 17 may
25 be applied around the article 12 in spaced parallel disposition using two or more reels 15 on each support 14.

Alternatively the tape 17 may be passed around the articles 12 in a vertical orientation instead of the horizontal orientation shown in the Figures, or two application stations may be provided in series, one
5 to apply tape in a horizontal orientation and the other to apply tape in a vertical orientation. These embodiments are particularly useful if the tape is to be applied for sealing purposes instead of or in addition to identification purposes.

Claims

1. A tape applicator machine comprising a conveyor operable to convey an article through an application station of said machine, two tape supply means disposed
5 on opposed sides of said conveyor, two tape support means disposed on opposed sides of said conveyor and each movable from a first position adjacent the respective side of said conveyor, whereby said article may pass between said tape support means to said application
10 station, to a second position, whereby tape from one supply means and supported by one support means is brought into contact with the tape from the other supply means and supported by the other support means, and cutting means operable to cut both of said tapes
15 simultaneously at their region of mutual contact.
2. A machine according to claim 1 wherein each said support means comprises a pair of rollers mounted in mutually substantially parallel disposition.
3. A machine according to claim 2 wherein said rollers
20 are spaced from each other by a distance sufficient to allow said cutting means to pass therebetween.
4. A machine according to claim 2 or 3 wherein each of said pairs of rollers are mounted on a support arm, said support arm being movable transversely of said conveyor.
- 25 5. A machine according to claim 4 wherein said cutting means is mounted on one of said support arms.

6. A machine according to any one of claims 1 to 5 wherein said machine further comprises sensing means operable to detect the presence of an article in said application station and to cause control means to move
5 said tape support means from said first position to said second position.

7. A machine according to claim 6 when dependent on claim 3 wherein said control means is operable to move said cutting means between said rollers of one of said
10 tape support means to cut said tapes.

8. A machine according to claim 6 or 7 wherein said control means is operable to stop said conveyor when said sensing means detects the presence of an article in said application station, prior to said moving of said tape
15 support means.

9. A machine according to claim 8 wherein said control means is operable to move said tape support means from said second position to said first position after said tapes have been cut.

20 10. A machine according to claim 9 wherein said control means is operable to restart the conveyor after said tapes have been cut.

11. A machine according to any one of claims 6 to 10 wherein said sensing means comprises photoelectric
25 sensing means.

12. A machine according to any one of claims 1 to 11

wherein each of said tape supply means comprises a support adapted to rotatably support a reel of tape.

13. A machine according to claim 12 wherein said tape supply means further comprises braking means operable to
5 allow but resist rotation of said reel.

14. A machine according to any one of claims 1 to 13 further comprising heating means adapted to heat said tapes in the region of said application zone.

15. A machine according to claim 14 wherein said heating
10 means comprises heated air blowing means.

16. A machine according to any one of claims 1 to 15 wherein said machine further comprises printing means.

17. A machine according to claim 16 wherein said printing means is located adjacent at least one of said
15 tape supply means.

18. A machine according to claim 16 or 17 wherein said printing means is located in said application station and is operable to print onto said tape when attached to said article.

20 19. A machine substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

Amendments to the claims
have been filed as follows

1. A tape applicator machine comprising a conveyor operable to convey an article through an application station of said machine, two tape supply means disposed
5 on opposed sides of said conveyor, two tape support means disposed on opposed sides of said conveyor and each movable from a first position adjacent the respective side of said conveyor, whereby said article may pass between said tape support means to said application
10 station, to a second position, whereby tape from one supply means and supported by one support means is brought into contact with the tape from the other supply means and supported by the other support means, and cutting means operable to cut both of said tapes
15 simultaneously at their region of mutual contact wherein each said support means comprises a pair of rollers mounted in mutually substantially parallel disposition.
2. A machine according to claim 1 wherein said rollers are spaced from each other by a distance sufficient to
20 allow said cutting means to pass therebetween.
3. A machine according to claim 1 or 2 wherein each of said pairs of rollers are mounted on a support arm, said support arm being movable transversely of said conveyor.
4. A machine according to claim 3 wherein said cutting
25 means is mounted on one of said support arms.
5. A machine according to any one of claims 1 to 4

wherein said machine further comprises sensing means operable to detect the presence of an article in said application station and to cause control means to move said tape support means from said first position to said
5 second position.

6. A machine according to claim 5 when dependent on claim 2 wherein said control means is operable to move said cutting means between said rollers of one of said tape support means to cut said tapes.

10 7. A machine according to claim 5 or 6 wherein said control means is operable to stop said conveyor when said sensing means detects the presence of an article in said application station, prior to said moving of said tape support means.

15 8. A machine according to claim 7 wherein said control means is operable to move said tape support means from said second position to said first position after said tapes have been cut.

9. A machine according to claim 8 wherein said control
20 means is operable to restart the conveyor after said tapes have been cut.

10. A machine according to any one of claims 5 to 9 wherein said sensing means comprises photoelectric sensing means.

25 11. A machine according to any one of claims 1 to 10 wherein each of said tape supply means comprises a

support adapted to rotatably support a reel of tape.

12. A machine according to claim 11 wherein said tape supply means further comprises braking means operable to allow but resist rotation of said reel.

5 13. A machine according to any one of claims 1 to 12 further comprising heating means adapted to heat said tapes in the region of said application zone.

14. A machine according to claim 12 wherein said heating means comprises heated air blowing means.

10 15. A machine according to any one of claims 1 to 14 wherein said machine further comprises printing means.

16. A machine according to claim 15 wherein said printing means is located adjacent at least one of said tape supply means.

15 17. A machine according to claim 15 or 16 wherein said printing means is located in said application station and is operable to print onto said tape when attached to said article.

18. A machine substantially as hereinbefore described
20 with reference to and as illustrated in the accompanying drawings.